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CURRENT LITERATURE

BOOK REVIEWS

Rhythm, periodicity, and zonation

KÜSTER's booklet[1] on zone formation in colloidal media contributes little if anything to botany as such, but is well worth while in presenting a point of view held by a number of continental workers. The first chapter (pp. 23) deals with equidistant zones, the second (pp. 41) with breaks, dislocations, etc., in the zones, the third (pp. 32) with excentric ring systems and polycentric diffusion fields, and the fourth (pp. 7) with zoological considerations and discussion. His point of departure is the Liesegang rings. The concentric rings are produced in a few hours after placing a droplet of 80 per cent $AgNO_3$ on 5–10 per cent gelatin plate bearing 0.1 per cent $K_2Cr_2O_7$. The rings consist of Ag_2CrO_4 and become more definite and more distant from each other as the distance from the drop increases. The author mentions OSTWALD's explanation of the Liesegang rings on the basis of zones of stable, metastable, and labile concentrations; also the fact that the explanation has been questioned.

The bands formed in capillary tubes show definite rhythm and polarity. Aside from the Ag_2CrO_4 bands, there are others caused by impurities in the gelatin which KÜSTER terms small rhythms, in contrast to the great rhythms of Ag_2CrO_4. Many conditions modify the patterns given by the precipitate of Ag_2CrO_4: contact with the dish in contrast to free gelatin, presence of foreign bodies in the gelatin, tensions and pressures, and others. In fact, patterns can be produced that resemble closely all the various patterns appearing in mottled leaves, in the arrangement of vascular elements of plants, and in markings of tracheae.

The writer emphasizes the fact that the pattern differentiation of Ag_2CrO_4 precipitate shown in the gelatin plate is a self-differentiation occurring under constant environmental conditions. This is taken to show that similar periodic or rhythmic structural changes in the cell may be independent of rhythm in the environment, a matter of self-differentiation. The work also indicates the possibility of the independence of such differentiation from vitalistic peculiarities. The fact that a simple diffusion process in gelatin gives complex polarized precipitation patterns leads the author to conclude that perhaps the complex patterns in the organism may likewise be referred to a simple diffusion process in a colloidal matrix, rather than explained by appeal to complex regulation processes. While this work deals in the main with analogies in morphological features, the writer emphasizes the fact that dynamic activities in the non-living often show rhythmic action determined by internal characters of the system rather than change of the environment. He cites, along with several other examples, the periodic elimination of oxygen when a clean mercury surface is covered with a neutral or slightly alkaline solution of hydrogen peroxide. In his later work the writer will undoubtedly turn more to the dynamic.

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[1] KÜSTER, ERNST, Über Zonenbildung in kolloidalen Medien. Beiträge zur entwicklungsmechanischen Anatomie des Pflanzen (erstes Heftes). pp. x+111. *figs. 53.* Jena: Gustav Fischer. 1913.

Rhythm in plant activity is held by many to be generally related to environmental rhythm. Others feel that rhythm is a necessity of the very nature of protoplasmic activity; activity must be followed by rest. An examination of the facts that KÜSTER offers shows the possibility of rhythms in the organism independent of environmental rhythm, and as well independent of the inscrutable features of protoplasm. In short, internally determined rhythms may be matters of relatively simple chemical and physical laws.—WILLIAM CROCKER.

Makers of British botany

Under this title, Professor OLIVER has edited a most interesting book.[2] The book grew out of a series of ten lectures delivered by various botanists at the University College of London in 1911. These lectures have been supplemented by six other chapters, so that the work might be more fully representative.

The botanists included and those who prepared the sketches are as follows: ROBERT MORISON (1620–1683) and JOHN RAY (1627–1705), by S. H. VINES; NEHEMIAH GREW (1641–1712), by Mrs. ARBER; STEPHEN HALES (1677–1761), by FRANCIS DARWIN; JOHN HILL (1716–1775), by T. G. HILL; ROBERT BROWN (1773–1858), by J. B. FARMER; Sir WILLIAM HOOKER (1785–1865), and Sir J. D. HOOKER (1817–1911), by F. O. BOWER; J. S. HENSLOW (1796–1861), by GEORGE HENSLOW; JOHN LINDLEY (1799–1865), by FREDERICK KEEBLE; WILLIAM GRIFFITH (1810–1845), by W. H. LANG; ARTHUR HENFREY (1819–1859), by F. W. OLIVER; WILLIAM HENRY HARVEY (1811–1866), by W. LLOYD PRAEGER; MILES BERKELY (1803–1889), by GEORGE MASSEE; Sir JOSEPH GILBERT (1817–1901), by W. B. BOTTOMLEY; W. C. WILLIAMSON (1816–1895), by D. H. SCOTT; HARRY MARSHALL WARD (1854–1905), by W. THISELTON-DYER; The Edinburgh professors (1670–1887), by I. BAYLEY BALFOUR.

It is impossible to review such a book in a brief space, but botanists will be glad to know where biographies of these botanists may be obtained. Each one stood for some phase of botany and contributed his share to its history. —J. M. C.

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[2] OLIVER, F. W., Makers of British botany, a collection of biographies by living botanists. 8vo. pp. 332. *pls. 26.* Cambridge: University Press. 1912. 9*s*.